CLAIMS

What is claimed:

1. A method for forming a vapor absorptive non-woven air filter comprising thermo-plastic fibers and adsorptive particles, said composite having a fiber density, comprising the steps of:

providing a non-woven carrier material having a surface and comprising thermo-plastic fibers;

applying adsorbent particles of an acidic polymer to said surface of said carrier material.

2. The method of Claim 1 further comprising heating said carrier material and applied adsorbent particles; and

calendering the heated carrier material with said adsorbent particles distributed therein;

wherein said heating and calendering steps are performed for a period of time and under a pressure selected to be sufficient for said adsorbent particles to become retained within said heated and calendered carrier material to form a calendered composite having an open fibrous structure of said given fiber density with the surfaces of said distributed adsorbent particles being substantially exposed for contact with air passing through said calendered composite, said resulting non-woven air filter composite being characterized by a pressure drop sufficient for use as an air filter.

3. The method of Claim 1 wherein the acidic polymer comprises a sulfonated copolymer.

4. The method of Claim 1 wherein the acidic polymer comprises a carboxylic copolymer.

5. A method for forming a filter element comprising the steps of:

a) forming a layer of adsorbent powder material;

b) delivering binder onto selected regions of the layer of adsorbent powder material to bond the regions of adsorbent material in accordance with a programmed model; and

c) repeating steps (a) and (b) until a filter element matching the programmed model is formed.

6. The method of Claim 5 wherein the binder includes an acid-polymerizable or acid-cross-linkable liquid.

7. The method of Claim 6 wherein the powder material includes divinyl benzene styrene copolymer.

8. The method of Claim 5 further comprising the step of removing excess powder.